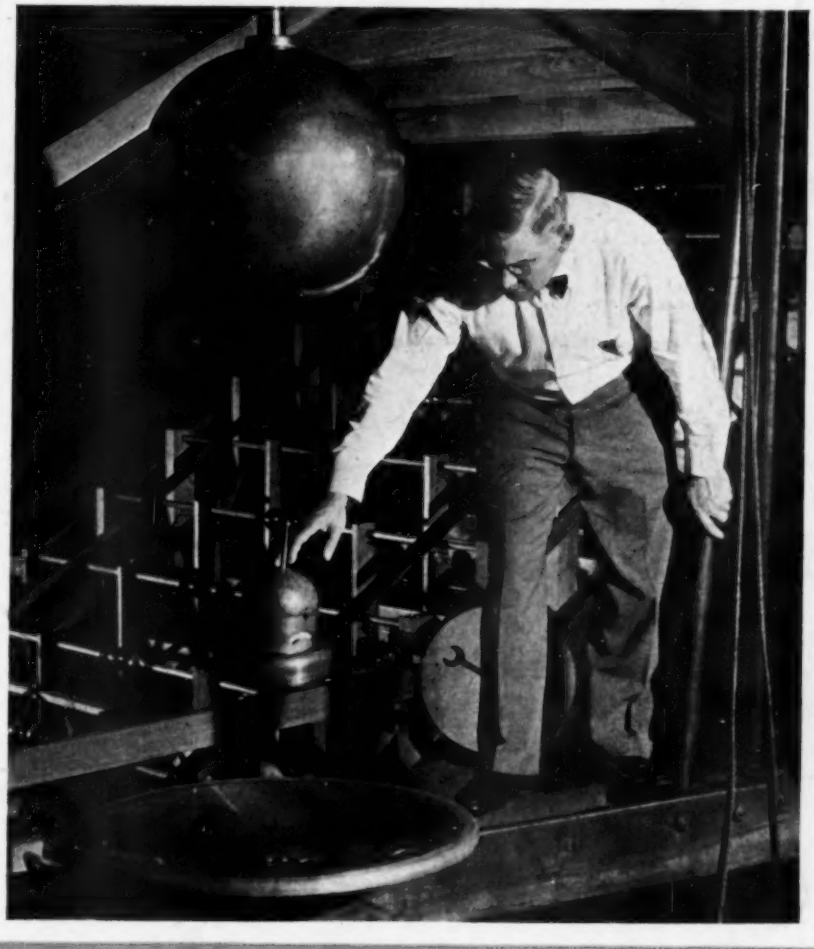
PRICE 15¢

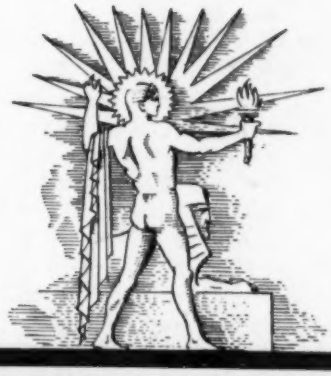
TECHNOLOGY DEPT.

SCIENCE NEWS LETTER

PUBLIC LIBRARY
NOV 5 - 1941
DETROIT

THE WEEKLY SUMMARY OF CURRENT SCIENCE •





November 1, 1941

Warns of Danger

See Page 280

A SCIENCE SERVICE PUBLICATION

Do You Know?

Cotton bred for a specific use in industry is a new development in this country.

Aiding *defense,* fishing tackle companies are producing delicate machine parts.

On oceanographer says that the *Pacific Ocean* is two feet higher on the Australasian side than on the American.

A British writer says that *birds* regard airplanes in four different ways—with indifference, curiosity, belligerence, and fear.

Some California Indian tribes used to enjoy cider made from *manzanita berries,* but this drink has gone out of fashion with them.

Thomas Jefferson introduced *one-way traffic* into his home, by providing a narrow stair for ascending and another for descending in one hall.

Indian boys learning *welding* at Haskell Institute say that they can weld anything from a broken eye of a sewing needle to a battleship.

If women would *dress* warmer in winter and men would dress cooler in summer, difficulty and expense of heating and cooling buildings would be lessened. two scientists report.

A geographer says that to conquer all *China* three strategic points must be taken: Shansi province, the crossing of the Yellow River at Tungkwan, and the Han valley, none of them held by Japan.

Nicaraguans eat the *cashew* fruit and throw the nut away.

A *bread* made of flour and orange peel is new in Palestine, where surplus orange crops are a problem.

Government scientists have invented a *cellophane bag* to reduce the weight of flower shipments by air.

By one estimate, *Nazi rule* has shuffled 9,000,000 people to new areas, and another 10,000,000 may yet be told to move.

The *garlic mushroom* has a garlic flavor.

Pushing a button, one British factory can *black out* 550,000 square feet of roof lights by shutters in 15 seconds.

A reddish-orange hybrid *tea rose,* especially developed, is named the "Rose Pan America."

Farm exports from the United States in the year ending June 30, 1941, were the lowest in 69 years.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in* SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

AERONAUTICS
What new instrument will tell an airplane pilot when he is going too close to a thunder cloud? p. 280.

ANTHROPOLOGY
How do scientists know that America's Cave Men wore clothes? p. 281.
What mystery may be cleared up by the unearthing of 500 skeletons? p. 276.

ASTRONOMY
Of what are the clouds in "empty" space composed? p. 283.

ASTRONOMY—RADIO
What delayed effect do sunspots have on radio? p. 282.

CHEMISTRY
What new chemical process removes reflections from glass surfaces? p. 275.

ENGINEERING
How would Alice in Wonderland look on a "dynamic screen"? p. 281.

GENERAL SCIENCE
How is the threat to fundamental science research being met? p 279.

INVENTION
How can chlorine be made from waste gases? p. 287.
How has the production of radioactive substances been speeded? p. 287.

MEDICINE
For what annual sum can good medical care be provided? p. 281.
How can the eyes of workers be saved from an infection due to a foreign body in the eye? p. 275.
How much have the sulfa drugs and serum cut the pneumonia death rate? p 285.
What new ointment will heal skin infections? p. 281.
Where will a Chinese physician be instructed how to start a blood bank? p. 276.

METEOROLOGY
What is the loss in electric power caused by the drought? p. 280.

NUTRITION
How is the Army changing America's food habits? p. 277.
What can be done now to affect the nutrition of 1961? p. 277.
What six vitamins do you need to remember when planning meals? p. 280.

PSYCHOLOGY—CONSERVATION
What is the purpose of the "fag bag"? p. 279.

PUBLIC HEALTH
On what frontier is America's battle against plague being fought? p. 285.
What has Britain done to protect the health of all her citizens? p. 278.
What step has been taken by the U. S. Public Health Service to prevent a physician shortage in defense areas? p 278.

PUBLIC HEALTH—RADIO
Why does the public not care for high fidelity? p. 286.

SCIENCE NEWS LETTER

Vol. 40 NOVEMBER 1, 1941 *No. 18*

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St. N. W., Washington, D. C. Edited by WATSON DAVIS.

Subscriptions—$5.00 a year; two years, $7.00; 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Back numbers more than six months old, 25 cents.

In requesting change of address, please give your old address as well as the new one, at least two weeks before change is to become effective.

Copyright, 1941, by Science Service, Inc. Republication of any portion of SCIENCE NEWS LETTER is strictly prohibited. Newspapers, magazines and other publications are invited to avail themselves of the numerous syndicate services issued by Science Service.

Cable address: Scienserve, Washington.

Entered as second class matter at the postoffice at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and in the Engineering Index.

The Science Observer, established by the American Institute of the City of New York, is now included in the SCIENCE NEWS LETTER.

Members of the American Association for the Advancement of Science have privilege of subscribing to SCIENCE NEWS LETTER, at $3 a year.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Advertising rates on application. Member Audit Bureau of Circulation.

SCIENCE SERVICE is the Institution for the Popularization of Science organized 1921 as a non-profit corporation.

Board of Trustees—Nominated by the American Association for the Advancement of Science: Henry B. Ward, University of Illinois; Edwin G. Conklin, American Philosophical Society; J. McKeen Cattell, Editor, Science. *Nominated by the National Academy of Sciences:* R. A. Millikan, California Institute of Technology; Harlow Shapley, Harvard College Observatory; William H. Howell, Johns Hopkins University. *Nominated by the National Research Council:* Ross G. Harrison, Yale University; C. G. Abbot, Secretary, Smithsonian Institution; Harrison E. Howe, Editor, Industrial and Engineering Chemistry. *Nominated by the Journalistic Profession:* O. W. Riegel, Washington and Lee School of Journalism; A. H. Kirchhofer, Buffalo Evening News; Neil H. Swanson, Baltimore Evening Sun. *Nominated by the E. W. Scripps Estate:* Frank R. Ford, Evansville Press; Warren S. Thompson, Miami University, Oxford, Ohio; Harry L. Smithton, Cincinnati, Ohio.

Officers—Honorary President: William E. Ritter. *President:* Edwin G. Conklin. *Vice-President and Chairman of Executve Committee:* Harlow Shapley. *Treasurer:* O. W. Riegel. *Secretary:* Watson Davis.

Staff—Director: Watson Davis. *Writers:* Frank Thone, Emily C. Davis, Jane Stafford, Marjorie Van de Water, Morton Mott-Smith. *Science Clubs of America:* Joseph H. Kraus, Margaret E. Patterson. *Photography:* Fremont Davis. *Librarian:* Minna Gill. *Business Manager:* Alvin C. Stewart. *Sales and Advertising:* Hallie Jenkins, Austin Winant. Correspondents in principal cities and centers of research.

MEDICINE

Sulfapyridine Saves Eyes Threatened By Type of Ulcer

American Academy of Ophthalmology and Otolaryngology Hears Report on Treatment of Infection Due to Injury

NEW use for sulfapyridine, saving eyes attacked by a highly destructive type of ulcer, was announced by Dr. Cecil W. Lepard, of Detroit, at the meeting of the American Academy of Ophthalmology and Otolaryngology in Chicago.

First patient whose eye was saved by sulfapyridine was a factory worker. While at work he got something in his eye (doctors term the something a foreign body). It was removed at the factory but within 24 hours infection had set in. He was sent to the hospital immediately and sulfapyridine treatment started. Within 24 hours improvement began and on the seventh day the inflammation had disappeared and the man went home.

By contrast, Dr. Lepard reported two previous cases in which factory workers each, in spite of all efforts to prevent it, lost an eye from ulcers caused by the *Bacillus pyocyaneus* following removal of a foreign body. The second patient had been given some sulfanilamide late in his illness, but it was too late to have much effect on the eye.

Dr. Lepard urged that no time be lost in beginning sulfapyridine treatment in these cases. The 48 hours required for a laboratory report on the type of infection is too long, he said, to wait before starting the treatment if the eye is to be saved.

Science News Letter, November 1, 1941

Study Eye Operations

IMPROVED results from operations to straighten cross eyes may result from findings reported by Dr. John H. Dunnington and Dr. Maynard C. Wheeler, of New York, to the American Academy of Ophthalmology and Otolaryngology.

The standard operation consists in shortening or lengthening the muscles that move the eye. Surgeons performing the operation, however, are faced with the difficulty of not being able to determine exactly how much to shorten or lengthen. No way of reducing this to a mathematical formula has ever been devised nor is one likely to be, Dr. Dunnington said. Consequently, it is sometimes necessary to perform a second operation to get the best possible results.

Overcorrection, which would make a turned-in eye turn out too far, is more likely to occur when the operation is performed on children between the ages of three and eight years, the New York doctors found in an analysis of results according to age which they hoped would give the ideal age for the operation.

More extensive surgery is needed, they found, for patients called "alternators," who have the difficulty first in one eye and then the other. For those having the difficulty in one eye only, more conservative operation is advised on the basis of their findings.

Science News Letter, November 1, 1941

CLEAR VISION

The troublesome reflections that make it difficult to see clearly through picture frame or show window are removed by a new etching process that leaves a thin film on the glass.

CHEMISTRY

Etching Glass Wipes Off Reflections From Surfaces

Vision Through Glass of Show Windows, Pictures, Instruments Made Clear by New Way of Depositing Film

A NEW chemical process that can wipe troublesome reflections off the glass of show windows, pictures, camera screens and lenses, and airplane instruments has come out of current RCA television research and a clue that was dropped in 1900 by Lord Rayleigh, noted English physicist.

The new method, developed by Dr. F. H. Nicoll, RCA Laboratories research scientist, is to expose the glass surface to hydrofluoric acid vapor. This vapor etches away a small amount of surface and leaves a thin, transparent film of calcium fluoride about one-quarter of a light wavelength in thickness.

This almost invisible film not only abolishes most of the reflection from the surface, but the light that otherwise would be lost in reflection is saved and transmitted through the glass. Thus the very thin film is of great usefulness in speeding up lenses used in photography and television.

Happily, tests show that the film formed by the hydrofluoric etching is very tough, withstanding washing with such things as water and alcohol. It can be heated safely to high temperatures.

The film formed in the glass treatment is purple in color, showing that yellow and green, to which the human eye is quite sensitive, are not reflected.

This discovery was made during experiments to improve contrast of television cathode-ray tubes. It promises to allow television to be viewed in rooms that are not quite so dark as heretofore required. Television images are light-painted on the glass face of the cathode-ray tube, passed through a glass protector plate and then reflected from a mirror. In each case reflection cuts efficiency unless the new film is used.

Very thin coatings have been successfully used in the last few years to suppress reflections from glass surfaces as a result of researches by Drs. John Strong, Katherine Blodgett and C. H. Cartwright. In these earlier processes coatings of various sorts have been added to the glass, while Dr. Nicoll's method etches the glass to produce a film. Commercial applications of the new process are being developed for early use.

Lord Rayleigh over 40 years ago jotted down in his records that hydrofluoric acid diluted in 200 parts of water took off a layer of glass each hour amounting to about a quarter wavelength of light. This was the clue used by Dr. Nicoll in developing his new process of making glass more transparent.

Science News Letter, November 1, 1941

ANTHROPOLOGY

Open 500 Tombs in Arctic To Identify Mystery Race

At Point Hope, Alaska, Is Unearthed One of Largest Collections of Sort Ever Found at a Site in America

DIGGING into 500 Arctic tombs at Point Hope, Alaska, two anthropologists excavating for the American Museum of Natural History have brought to daylight enough bony evidence, they hope, to clear up a strange mystery of the ancient Far North.

The 500 skeletons, unearthed by Dr. Harry L. Shapiro and Dr. Froelich G. Rainey, are pronounced one of the largest collections of the sort ever found at a site in America. The two anthropologists sought remains of an ancient and unknown people, whom Dr. Rainey first discovered in expeditions of 1939 and 1940. Also they sought later Eskimo burials which would aid in showing what relationship the lost ancients had to the later Eskimos.

The mysterious unknowns had a remarkably big town with well-planned streets, over 100 miles north of the Arctic Circle; and about 2,000 years ago they abandoned this settlement. A lost race, American Museum scientists have rated them, because their ivory arts are unlike those of known Alaskan Eskimos, ancient or modern. Also, it is explained, they lacked many typical Eskimo implements, and were more dependent on land than sea for resources.

In his laboratory at the museum, Dr. Shapiro plans to examine the physical traits of the forgotten Northerners, to place them more definitely in the melting-pot story of prehistoric America. The Ipiutaks, as they are now called from the Eskimo name of a spit of land near their old home, may have come from as far away in Asia as north China.

A new glimpse into curious burial customs of the Ipiutaks is revealed by a carved ivory mask with staring inset ivory eyes, which was found covering the body of a little child. The child lay resting on the knees of a man, and a woman also accompanied it. Masks with ivory eyes have been found before in the graves of these mystery people, but what their significance was for a future life remains one of the unsolved puzzles of the Arctic.

Science News Letter, November 1, 1941

MEDICINE

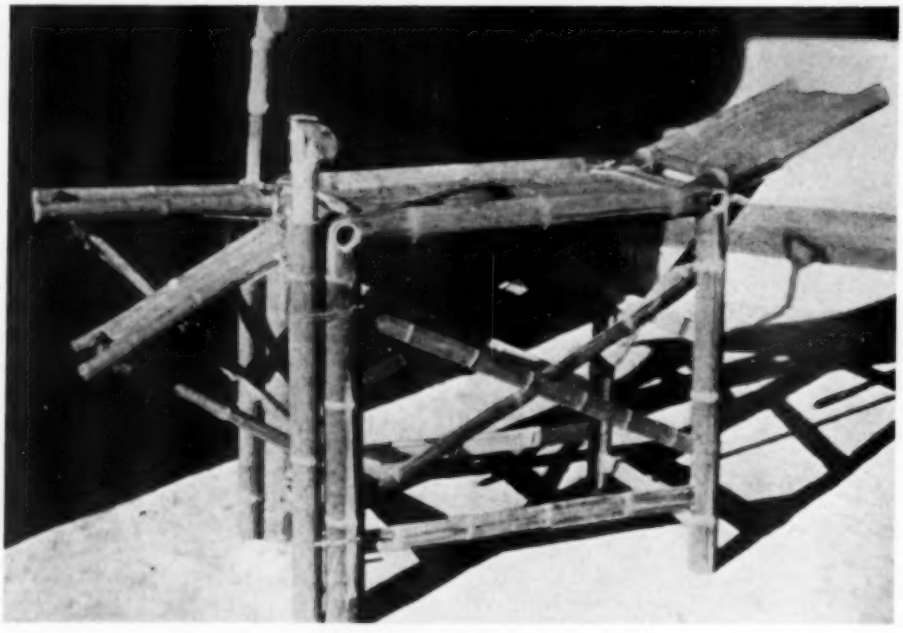
Chinese Doctor In U. S. Wanted To Run Blood Bank

WANTED—a young Chinese doctor somewhere in the United States who is willing to go back to China to run China's blood bank, vital in saving thousands of lives there.

Dr. John Scudder of the Presbyterian Hospital, New York City, creator of the blood plasma bank for Great Britain, has offered to teach this young Chinese volunteer the technique of running China's bank and preparation of the plasma as a blood substitute. He must be a medical graduate with laboratory training.

The Chinese bank is under the Medical Relief Corps of the Chinese Red Cross. A fellowship of $1,000 for the young doctor during a year's training at Columbia Presbyterian Medical Center, has been provided by the American Bureau for Medical Aid to China, a member agency of United China Relief at its New York headquarters, 1790 Broadway.

Declaring that lack of trained personnel is a serious bottleneck in China's medical relief, Dr. Donald D. Van Slyke, who heads the American Bureau for Medical Aid to China, said that his bureau is recruiting as many Chinese



COST—TEN CENTS

Surgeons trained in the finest hospitals in Europe and America going to China to serve in the Medical Relief Corps, find that they must make their own equipment out of primitive materials. One ingenious surgeon built his own operating table out of bamboo, at a total cost of ten cents in American money.

FOR CHINESE BLOOD BANK

In a straw-thatched hut like these at Chinese Red Cross headquarters in Kweiyang, China, will be created a plasma bank for China's wounded soldiers.

or American physicians as they can, who can meet the difficult requirements. Volunteers must be under 40, must speak Chinese, be graduates of recognized schools, and strong and willing to endure hardship and primitive living. Less than 200 graduate doctors are caring for wounded and sick in an army of 4,000,000.

Doctor-mechanics are an emergency invention for China's medical problem. Given three months' organized emergency training, these men aid the doctors by undertaking such tasks as setting broken bones, bandaging, diagnosing prevalent diseases like typhoid and relapsing fever, and undertaking sanitary delousing and water sterilizing measures.

Science News Letter, November 1, 1941

NUTRITION

What Babies Eat Now Affects Adult Nutrition of 1961

America Is Still Falling Short of Meeting Nutrition Needs; Medical Students Not Taught Enough About It

DECLARING that the United States must work harder to feed its babies now, to have well-nourished adults in 1961, Dr. Katherine Bain of the U. S. Children's Bureau told dietitians that America fails to teach its medical students and nurses enough about low-cost nutrition.

"Probably not one per cent. of internes in the country know the difference between a Grade A and Grade B egg," said Dr. Bain.

America is still falling far short of meeting its nutrition needs, Dr. Bain said, addressing the American Dietetic Association meeting at St. Louis. School lunch programs, providing a good meal a day for up to 2,000,000 children, the food stamp plan, home gardens, and relief payments all help but are not enough, she stated.

Pointing out that well-run child-health conferences now spend 75% of the physician's time teaching mothers what and how to feed their children, Dr. Bain said that a stumbling block in medical education is the weak nutrition training of doctors and nurses. The medical student or interne learns to concoct a perfect diet for the diabetic child and can usually feed an infant if cost is no object, but is not taught at school how to get a good diet for the normal child in low income groups.

Every infant, however "normal," needs to have his diet adjusted to his individual needs, the physician stated. Yet, at present there are in the United States only about 1,000 certified obstetricians whose time and energy could not possibly stretch over the more than 2,000,000 infant births a year. There are about 1,500 certified pediatricians, who could not see all the newborn infants and direct their feeding, if they worked 24 hours a day.

"Yet the care of all mothers and infants is a fundamental public health principle," said Dr. Bain.

Science News Letter, November 1, 1941

Expands Canteen Training

THE AMERICAN Red Cross is rapidly expanding its nutrition and canteen training of volunteers, and the thousands thus trained will be valuable to the country in war or peace, Miss Melva Bakkie, Red Cross staff nutritionist, told the American Dietetic Association.

Red Cross chapters offering nutrition courses have trebled recently, and there are no less than 700 instructors teaching nutrition classes alone. The standard, 20-hour nutrition course for "nutrition aids" teaches facts about improving diets at all income levels, and proper food habits and practices. The course also trains volunteers to take part in community activities in nutrition.

The 20-hour canteen course, open to those who have had a nutrition course, will provide, Miss Bakkie said, "an organized group of volunteers who can work together and use uniform procedures so that group feeding is effective."

Canteen training is important, not only in war emergencies such as bombed-out or sabotaged neighborhoods, but also in general emergencies of floods, explosions, fires and storms.

A new 25-cent nutrition text book prepared by the Red Cross for its volunteer students is on the press.

Science News Letter, November 1, 1941

Army Will Change Diet

AMERICA's eating habits are going to be changed by this World War —all because a million and a half, and maybe more, young American soldiers are acquiring new ideas of what's good to eat. When they go marching home, it will be up to mothers and brides, not to mention the farmers and grocers, to meet the young men's new food demands.

This is the prediction made by Col. R. A. Osmun of the Army Quartermaster Corps, in an address before nutrition

experts attending the American Dietetic Association meeting. Col. Osmun declared that one of the greatest experiences of our generation is the U. S. Army's correct feeding of one and one-half million men three times a day.

Looking ahead, Col. Osmun foresees that schools will be affected.

"I believe," he said, "that young girls will be taught to cook better and probably to spend more time in preparing food."

Farmers may be the first to feel the effects of Army-style eating at civilian dinner tables. Giving a tip to one-crop farmers, the Army Colonel said that, if wise, these farmers will start producing fresh fruits, vegetables, milk, or other protective foods to meet the demands of men accustomed to Army eating. Quite wrong, he said, was the attitude of a hill-billy merchant who complained that the Army was teaching boys luxurious habits, like milk drinking. They won't get it at home, said the merchant. They should, said Col. Osmun, adding that some enterprising young man will develop a dairy herd in such neighborhoods to supply that demand, and others will follow suit.

Army feeding methods may also have an effect on farm cooperatives and the packing industry, encouraging them to find better methods of marketing fresh food thousands of miles from home.

Science News Letter, November 1, 1941

PUBLIC HEALTH

Health Service Acting To Avoid Doctor Shortage

BECAUSE of the serious shortage of physicians in many vital defense areas, Surgeon General Thomas Parran, U. S. Public Health Service, asks through the *Journal of the American Medical Association* (Oct. 25) that doctors desiring to locate in such areas communicate with him.

The demand for medical care is already so urgent, and likely to be increased during the coming winter, that doctors should find it relatively easy to establish practices in these areas. Defense housing projects offer office and living accommodations.

Every precaution is to be taken to avoid removing physicians from localities already undersupplied, but the U. S. Public Health Service, in cooperation with the Division of Defense Housing, FWA, is interested in acquainting physicians with the needs of the defense areas.

Science News Letter, November 1, 1941

PUBLIC HEALTH

Britain To Assure Complete Hospital Service to All

All Hospitals, Voluntary and Tax-Supported, Now Unified in One System; Improvements To Be Permanent

A REVOLUTIONARY step in Britain's health program, making available comprehensive hospital service to every person needing it, will soon be taken, Sir Wilson Jameson, chief medical officer of the British Ministry of Health, made known at the American Public Health Association meeting at Atlantic City.

By this plan, patients will pay for services if able, but the service will be available to all regardless of ability to pay. Part of the cost will be met by counties and large towns and part by the national government.

All hospitals, voluntary and tax-supported, are now unified in one national hospital system, Sir Wilson pointed out, although few realize it.

This came about because the government took over some existing hospital beds and added new ones in preparation for expected war casualties and reallocated the hospital staffs for efficient service during the emergency. The new step shortly to be taken will insure that the gains from this unification of hospitals will not be lost after the war.

The health of the English people has not suffered and in some ways has improved during two years of war, Sir Wilson declared.

Cases of nervous and mental disease of psychoneurotic type are actually less among the civil population than they were before the war.

With the exception of meningitis, infectious diseases have not occurred. Cooperation of the public in boiling water and efficiency of sanitary engineers in repairing water mains and sewage systems have prevented typhoid fever epidemics in spite of the endless number of times water mains and sewers were bombed and water contaminated in air raids.

Large numbers were saved from death by bombing through the evacuation of children from "target towns," Sir Wilson declared.

This evacuation policy also helped to keep down epidemics, as those evacuated were in the age group most susceptible to many of the communicable diseases.

Chief lesson for America to learn from England's war health experiences, it appears, is to build up adequate maternal and child health facilities and improve housing in even the smallest towns and rural communities. The excellence of the English health facilities, built up between the two World Wars, and the rehousing during the same period of millions in individual homes contributed largely to the good health which has been maintained through evacuation of cities, air raids and the accompanying disruption and destruction of the war.

Science News Letter, November 1, 1941

ASTRONOMY

Solar System Immersed In Great Cloud of Gas

MINUTE differences in the colors of stars in different parts of the sky have led to the discovery that our solar system is immersed in an obscuring layer of gas 1,600 light years thick extending out 100,000 light years to the limit of the milky way. The discovery was made by Dr. Joel Stebbins, Dr. C. M. Huffer and Dr. A. E. Whitford of the University of Wisconsin working with the 100-inch reflecting telescope of the Mt. Wilson Observatory.

Stars have been found to be slightly reddened when their light passes through thin cosmic clouds in much the same way that the sun is made to look redder at sunset when its light passes through the most atmosphere. The extent of the cloud was determined from previous knowledge of the amount by which starlight reddens with distance. The change in tint was detected with the photo-electric cell or "electric eye" similar to those used to operate burglar alarms and similar devices. The photo-electric cell used on the 100-inch telescope was so sensitive that it could detect the heat from a candle 3,000 miles away if there were no atmosphere.

Science News Letter, November 1, 1941

GENERAL SCIENCE

Fundamental Science Faces Serious Problems of Support

Each One of Us Has Tremendous Stake in Future Of Science; Life Itself Depends on Health Progress

By DR. WILLIAM J. ROBBINS
Chairman, National Science Fund

Digest of radio talk given over the Columbia Broadcasting System under the auspices of Science Service. Dr. Robbins is director of the New York Botanical Garden.

EACH one of us has a tremendous stake in the future of fundamental science. To millions of people, the stake is life itself, for advance in medicine, sanitation, and public health, which gives life to millions, depends upon fundamental science. We are all familiar with the material conveniences and comforts which science has given us, but we often forget the original patient, fundamental research which made them possible, and will be the basis for future advances.

The scientists who carry on fundamental research are like explorers. They are continually seeking to push forward the frontiers of knowledge, by discovering basic principles and how some law of nature works. Their discoveries are the raw material of applied science. If their kind of research should end, then progress in all applied science would presently end also, just as the water fails when the spring runs dry.

We forget the significance of fundamental science sometimes, just as we forget that fundamental science cannot support itself, since even the greatest of these basic discoveries cannot often bring to the scientist or to his institution any immediate return in money. For this very reason, the greatest part of such research in this country is carried on in our universities and in a few specially endowed research institutions. (Industry and government incline toward *applied* research—the application of some fundamental discovery to immediate problems).

Today fundamental science is confronted by a serious problem: universities and research institutions in general have been hard hit in recent years by reduced earnings on their endowments at a time when gifts and bequests have fallen off sharply. These institutions no longer have the funds to finance much essential research. As a result, fundamental science is receiving less support today than at the end of the 1920's.

To help supplement existing support for science, the National Academy of Sciences has created the National Science Fund—a national clearinghouse for advice on philanthropy in science. In every community there are many persons who would like to make large or small gifts for science, but who hesitate because they do not know how it can be done effectively. Sometimes they feel that the amounts which they can afford to give would be of slight assistance to science.

Through the National Science Fund, any donor may obtain the advice of those scientists best qualified to assist him in making a useful gift to science. If he wishes, the Fund will administer his gift for him. Through the Fund, many smaller gifts may be pooled to accomplish large results. The National Science Fund does not carry on any research of its own, but acts through those institutions and scientists best qualified to undertake the research at that time.

Scientists today have great faith in the infinite possibilities of science in the future. So do countless laymen. Through the National Science Fund, every one —scientist or layman—can share in the adventure of exploring these unknown realms.

Science News Letter, November 1, 1941

PSYCHOLOGY—CONSERVATION

"Fag Bag" for Cigarettes Reminds Smokers of Fire

"Fire-Conscious" Pledge Tag on Drawstring Serves To Break Automatic Smoking Habit at Right Moment

PSYCHOLOGY has turned out an answer to automatic cigarette smoking in America's forests.

It's the fag bag, a small red muslin sack into which a smoker entering a forest must place his package of cigarettes. The bag is closed with a drawstring, to which is attached a "fire-conscious" pledge tag signed by the smoker. Together, the bag, drawstring and tag make thoughtless "lighting up" impossible.

Before the fag bags were given an experimental tryout recently in Angeles National Forest, located in Southern California, the idea was submitted to psychologists. One and all, they put the stamp of approval on the bags, declaring the bits of muslin served to break up the habit pattern of automatic smokers at the right moment, that is, at the moment of reaching for a cigarette.

An example of the way men of science viewed the fag bags, which Girl Scouts made by the thousands for the United States Forest Service, is this statement by Dr. Robert A. Millikan, Nobel prize winner and head of the California Institute of Technology:

"The use of fag bags as a means of reducing the forest fire hazard from careless smokers seems to me to be not only ingenious but psychologically sound. I hope that it will prove to be increasingly successful."

In behalf of Mt. Wilson Observatory's staff of world-famous astronomers, Dr. Alfred H. Joy declared of the bags:

"We are always greatly interested in the matter of fire protection, not only because of our equipment in the National Forest on Mount Wilson, but because we have a very live appreciation of the beauties and benefits of the tree-covered mountains in our vicinity. I am sure that the very clever idea of the cigarette bag will call attention to this matter in such a way that it will encourage carefulness on the part of smokers. This method is psychologically correct in that it does not bring up any latent opposition which might be caused by regulations being put upon the visitor to the forest."

Fag bags already are in fire season use in three Southern California forests and may be in all of the nation's timberlands next year.

Science News Letter, November 1, 1941

AERONAUTICS

Instrument Warns Pilot If Too Close to Lightning

See Front Cover

A NEW airplane instrument that allows the pilot to detect dangerous intensities of electricity in a nearby thunder cloud has been developed by the General Electric Company's general engineering laboratory.

It is a delicate device consisting of a neon tube and micrometer connected to a pointed tungsten rod that looks like a lead pencil protruding 14 inches from the plane. The rod picks up the electrical discharge from the cloud and sends it through the instrument. The neon tube flashes and the needle deflects. If the intensity of the disturbance is too great the pilot changes his course.

The instrument, as it was set up in the General Electric High Voltage Laboratory for testing, is shown on the front cover of this week's SCIENCE NEWS LETTER. The large sphere above represents the cloud. The plate below represents the earth.

The new instrument has been christened "Cloud Charge Indicator." C. M. Foust, who headed the group of high-voltage and lightning experts that developed it, is shown inspecting the instrument.

Airplane accidents in the past that seem to have been due to lightning are believed to have spurred the invention of the instrument.

Science News Letter, November 1, 1941

NUTRITION

Vitamins to Remember In Planning Meals

IF YOU are bewildered by the large number of vitamins now known, the following list may help you to keep them straight. A complete list would show 26 or more vitamins. Many of these have not yet been proved essential for human nutrition. Those you need to remember in planning your daily meals are:

Vitamin A, found in cod liver oil and other fish liver oils, green leafy vegetables, yellow vegetables, liver, milk, butter, apricots, peaches and dried prunes; needed for normal growth and health and specifically to prevent night blindness.

Vitamin B1 (thiamin), found in yeast, whole grains and whole grain flour and breakfast cereals and enriched flour and bread, pork, liver, organs and muscles (lean meat) of many animals, nuts, eggs, and most vegetables; prevents beriberi and other nerve disorders; promotes appetite, morale, and intestinal function; essential for proper nerve function and utilization of starches and sugar.

Nicotinic acid, found in yeast, liver, wheat germ (this means whole wheat bread and flour and enriched bread are good sources), milk, lean meat and some leafy green vegetables; prevents and cures pellagra.

Riboflavin, found in yeast, milk, liver, wheat germ, eggs, cheese, leafy green vegetables, peas, lima beans, and organs and muscle or lean meat of many animals; promotes growth and protects against a special skin disorder and certain abnormal changes in the eyes which result in failing vision.

Vitamin C, found in oranges, lemons, tomatoes, grapefruit, fresh strawberries, raw cabbage, green peppers, and other fresh fruits and vegetables; prevents and cures scurvy; needed for proper growth of bones and teeth.

Vitamin D, found in cod liver oil and some other fish liver oils and produced by action of ultraviolet light on the skin; has been added to some kinds of milk; prevents and cures rickets.

Science News Letter, November 1, 1941

METEOROLOGY

River Flow in East Lowest on Record

RIVER flow in Maine, Vermont, Tennessee, Indiana and North Carolina during the past year was the lowest on record, the U. S. Weather Bureau reported. This has caused a loss of some 3,000,000,000 kilowatt hours of electrical energy. The low output of the Tennessee River has impeded defense.

Continued absence of rain and high temperatures intensified drought conditions in the East during the past week. There has been a remarkable absence of rain in this area for the past two months, the Weather Bureau reported. In many places all vegetation has dried up. Pasture fields are brown and bare, and domestic water conditions serious.

In extraordinary contrast, the Middle States are wet and soggy with excessive rains. Crops have been ruined and field work in general is held up.

Unseasonably warm weather has prevailed all over the country during the past week except in New England where temperatures have been slightly below normal.

Science News Letter, November 1, 1941

IN SCIENCE

MEDICINE

Sexual Deficiency Aided By Synthetic Hormone

TREATMENT of sexual deficiency has been advanced by development of a synthetic male sex hormone, methyl testosterone, which is effective when given by mouth instead of by hypodermic injections or by operation to implant a hormone bank in the patient's body, Dr. Samuel A. Vest and Dr. Bruno Barelare, Jr., of the University of Virginia Hospital, report (*Journal American Medical Association,* Oct. 25).

They report that two grown men, deprived of normal virility by castration or glandular failure, have been given normal vigor by daily doses of this hormone which also speeded to normal the delayed development of a 14-year-old boy.

The entire stomach of one of the men had been removed because of a cancer but he nevertheless was able to absorb the sex hormone doses given by mouth. The size of the hormone dose is three to four times that needed when given by hypodermic injection. The convenience of simply swallowing the medicine, however, and the reduction of necessary visits to the doctor's office, the Virginia scientists point out, makes up for the larger amount needed.

Science News Letter, November 1, 1941

ENGINEERING

High Power Mercury Lamps Speed Blueprint Making

SPECIAL high power mercury arc lamps that have been developed by optical engineers to speed up the production of blueprints—needed in vast quantities in defense work—were described by Wm. T. Anderson, Jr., of the Hanovia Chemical & Mfg. Company, Newark, at the meeting of the Optical Society of America in New York.

The lamps give a very high intensity of light in the near ultraviolet region to which the sensitized paper is most responsive. By thus shortening the exposure, reproduction is speeded.

Science News Letter, November 1, 1941

E FIELDS

MEDICINE

$21 Per Year Provides Good Medical Care

GOOD medical care at $21 per year per person can be provided for industrial workers and their families, Dr. Franz Goldman, of Yale University School of Medicine, reports in the current issue of *Medical Care,* published by the Committee on Research in Medical Economics.

Dr. Goldman surveyed four industrial health plans, two in eastern and two in southern states. Two are wholly financed by the employer, one costing slightly more than $1,000,000 a year.

The other two are jointly financed by employer and employee. The four plans have been functioning from 17 to 28 years and cover groups, including dependents, numbering from 5,000 to 100,000.

Services include those of general practitioner, surgeon, other specialists, home nursing, hospital care, maternity care, periodic health examinations and other preventive measures, physical therapy, X-ray, laboratory and usually medicines. Dental care of varying scope is included in three of the plans.

Dr. Goldman attributes the low cost to four factors: Full use of preventive medicine; even spread of risks over a large group; economies resulting from group practice; and the integration of curative and preventive services.

Science News Letter, November 1, 1941

ENGINEERING

Future Movie Screens May Be Full Size of Stage

LOOKING into the future of the motion picture, the next great novelty will perhaps be a "dynamic screen" as wide and as high as the entire theater proscenium.

This prediction was made by Robert W. Russell of Army's Training Film Production Laboratory at Fort Monmouth, N. J., before the Society of Motion Picture Engineers.

The projector will have the power, he said, to throw any size picture on any part of the screen or to cover the whole of it as desired, thus to produce a great variety of effects.

As an example, he described how Alice in Wonderland would look on a dynamic screen.

"Alice would be reduced to a mite. She looks upward and sees the table. She finds the bottle and she drinks the potent liquid. Now she begins to grow, rising across the screen until she truly is enormous, when her head bumps the ceiling. The element of realism would be injected to a startling degree."

The familiar rectangular screen shape is too rigid—like viewing everything through a window. "Grandeur" wide-film, square frame, the circular "iris-in," are but feeble attempts to get away from it, he declared. The picture industry needs another "sudden impact of novelty," a wider latitude for artistic and dramatic expression.

Science News Letter, November 1, 1941

ANTHROPOLOGY

America's Cave Men, 25,000 B.C., Wore Clothes

TRACING human occupation of North America back into the Ice Age, more than 25,000 years ago, scientists now report evidence that earliest Americans who reached New Mexico were cave men and hunters, knew how to build fires, apparently wore clothes, and probably cooked their food.

Results of five seasons of digging into Sandia Cave, New Mexico, where revelations of "Sandia Man's" ancient style of living have been unearthed, are reported by Dr. Frank C. Hibben of the University of New Mexico in a bulletin just issued by the Smithsonian Institution.

Out-ranking the famous Folsom Man type of American in remote antiquity, Sandia Man's traces of housekeeping lie in this cave buried far beneath debris left by Folsom occupants. That the earliest known people of this continent made clothing is inferred by finding Sandia Man's (or his wife's) snub-nosed scrapers, the kind of tool that Europe's Old Stone Age people used to scrape animal skins for garment making.

Some of Sandia Man's spearheads or other projectile points are pronounced remarkably like those made in Europe about the same time during the Solutrean stage of the Old Stone Age. It is possible, Dr. Hibben says, that a general pattern of workmanship spread over much of Europe and Asia and thence into the New World.

Science News Letter, November 1, 1941

MEDICINE

Sulfathiazole Ointment Heals Skin Infections

SULFATHIAZOLE, potent remedy for pneumonia and other serious infections, when made into an ointment and rubbed on the skin appears to be an effective remedy for such common skin diseases as acne, impetigo, infected eczema and boils, Dr. Edmund L. Keeney, Dr. Richard H. Pembroke, Dr. Ferdinand E. Chatard and Dr. James M. Ziegler, of the Johns Hopkins and Union Memorial Hospitals, Baltimore, report (*Journal, American Medical Association,* Oct. 25).

Use of the sulfathiazole ointment to treat 69 children and grown-ups with various skin infections showed it was also effective in seborrheic dermatitis and bacterial folliculitis.

In each of 35 poison ivy patients given the ointment, the condition healed without infection. This seems important, the Baltimore doctors point out, because physicians generally refrain from prescribing an ointment for acute blistering skin disorders because of the danger of promoting secondary infection.

In 33 patients with cuts and 4 patients with second degree burns the sulfathiazole ointment brought about healing without infection in every case.

The 5% sulfathiazole ointment is made by suspending finely powdered sulfathiazole, which had been sifted through bolting cloth to remove large crystals, into equal parts of hydrous wool fat and vanishing cream.

Science News Letter, November 1, 1941

BIOLOGY

Food-to-Energy Link Extracted From Yeast

EXTRACTION from baker's yeast of a vital link in a chemical chain by which the body gets energy from food is announced by Prof. T. R. Hogness and associates, A. M. Altschul and H. Persky, of the University of Chicago (*Science,* Oct. 10).

The link is an enzyme, one of many which pass along hydrogen from a molecule of sugar, for example, until at the end of the chain it is combined with oxygen to form water to the accompaniment of energy needed for body growth and function. This particular enzyme is the link between two other links known to chemists as dihydrodiphosphopyridine nucleotide and cytochrome C.

Science News Letter, November 1, 1941

New Machines And Gadgets

Novel Things for Better Living

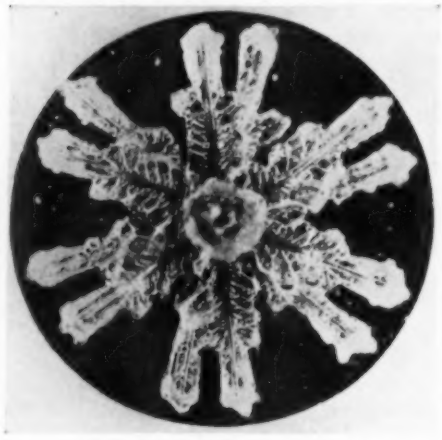
You can test your spark plugs and determine the width of the spark gap without removing them from the engine, by means of a new ignition tester made in the form of a screwdriver. The device has been awarded a patent. There is a lamp in the transparent handle which flashes when proper contact with the spark plug and the engine is made —provided the ignition is working. A cylindrical band on the handle, when turned, gradually opens a secondary spark gap in the handle. When this gap corresponds to that in the engine, the lamp ceases to flash and the spark can be seen within the handle. A scale on the movable band tells the width of the spark gap.

Rubber gas tanks in place of aluminum are not for the purpose of contracting as gas shortages require, but to save aluminum and to provide self-sealing tanks for airplanes. Besides, they are not exactly made of rubber, but of a substance derived from rubber, a substance that is one-third as heavy as aluminum and two-thirds as strong. Bullet holes shot in these tanks seal almost immediately, preventing leakage of gasoline which is one of the main reasons why airplanes come down in flames.

Now you can shave and trim your hair too with the same electric razor. An attachment has been patented which slips over the business end of the razor, providing it with longer and larger teeth. It can be placed close to the cutters or a short distance from them, according to whether you wish to trim the hair from the back of your neck or your sideburns or from elsewhere on your head.

Policemen, it seems, sometimes carry a flashight in the tip of their nightsticks or billies. A patent has been awarded for an improvement in such an arrangement, the improvement consisting in a more convenient and accurate means of focusing the light so that it can look you straight in the eye without flickering.

A snowflake can be preserved in all its delicate detail in a very simple way. This does not mean a photograph or a reasonable facsimile, but an actual three-dimensional replica. Catch a snowflake on a piece of black velvet, lift the flake carefully with a toothpick and transfer it to a microscope slide on which has been placed a drop of a weak solution of a suitable resin. If the flake is large, an additional drop of the resin may be placed on top. All this must be done outdoors and everything used must be cooled below the freezing temperature. Good results have been obtained with a one per cent. solution of polyvinal formal resin dissolved in ethylene dichloride. When the solvent evaporates it leaves a replica of the snowflake that can be preserved indefinitely.



Lots more fun can be had with a toy train when equipped with a remote control device that has recently been patented. From a single convenient location in the room all operations of the train can be controlled. It can be made to go forwards or backwards at different speeds. The lights on the train can be switched on or off without leaving your seat. The mechanism works on the principle of the telephone dial. You dial your order and a mechanism on the train similar to that used in the actual telephone service is actuated according to the number of impulses sent by the dial in returning to its initial position.

To warn soldiers of poison gas, and to signal them to put on their gas masks, a small hand-cranked siren is being manufactured by a Chicago company. The government, it is said, has ordered 30,000 and plans to provide each group of 60 soldiers with a siren alarm.

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, *1719 N St. N. W., Washington, D. C., and ask for Gadget Bulletin 77.*

Science News Letter, November 1, 1941

● RADIO

Thursday, November 6, 3:45 p.m., EST

On "Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Frank B. Jewett, president of the National Academy of Sciences, will discuss the relation of industry to fundamental research.

Listen in each Thursday.

Monday, November 10, 9:30 p.m., EST

Science Clubs of America program over WRUL, Boston, on 6.04 and 11.73 megacycles.

One in a series of regular periods over this short wave station to serve science clubs, particularly in high schools, throughout the Americas. Have your science group listen in at this time.

ASTRONOMY—RADIO

Sunspots May Cause Delayed Radio Blackout

GIANT sunspot groups, such as that which caused the great aurora of Sept. 18, shoot out into space slow-moving charged particles of about 1,200 miles per second velocity as well as speedier particles. New evidence for this theory has come from observations made by Dr. Harlan T. Stetson of the Massachusetts Institute of Technology suburban laboratory in Needham, Mass., which showed a lag of about a day between sunspot effects upon short-wave transmissions and broadcast bands.

An abrupt drop in the field intensity of the National Bureau of Standards 5 megacycle transmission of standard frequency signals over WWV from Washington was observed at the same time that the aurora appeared.

Dr. Stetson also measures regularly the field strength of Station WBBM, Chicago. It was the next night before these transmissions were affected. They then practically disappeared.

Relatively speedy particles from the sun had an effect on the F ionized layer the first night and the slower particles a day later changed the E layer or the Kennelly-Heaviside layer. These layers in the upper atmosphere act as mirrors to reflect the radio waves and thus allow them to reach great distances by going from earth to layer and from layer to earth repeatedly.

The way in which the radio waves acted as the result of the largest sunspot group since the sunspot maximum in 1937 bears out Dr. Stetson's investigations over the past ten years. The delayed effect on the E layer upholds the theories of Chapman and Grotrian that there are the slow-moving particles, although it may also mean that time is required to build up an excessive degree of ionization at the E layer level to kill the transmission of radio waves at broadcast frequencies.

The fact that the big aurora display of September came close to the equinox has some significance to Dr. Stetson. The Easter disturbance of 1940 also came at the time of an equinox. There is good physical reason why this should be so. At the equinox the axis of the earth is perpendicular to the line joining the sun and the earth and the sun's pole is tipped towards the earth. Thus at this time any sunspot is more nearly in line with the sun-earth direction than would be the case at other times of the year.

Science News Letter, November 1, 1941

ASTRONOMY

Study "Empty" Space

Far From Complete Vacuum, It Holds Cosmic Clouds Of Enormous Size and Inconceivably Low Density

HALF the Milky Way, it has been estimated, is "dust."

The great stellar system of which the sun and its planets is a part contains billions of stars. They are so thinly distributed that light, traveling at approximately 186,000 miles a second, takes six or seven years to go from one to another.

Until a few years ago it was assumed that these vast spaces were empty. They are, according to any common terrestrial idea of emptiness. The most complete vacuum attainable on earth would be extremely dense in comparison with the state of matter in the great interstellar interstices.

But when compared with an ideal vacuum, these enormous, atmosphereless stretches of nearly absolute cold are actually full of gas and dust. Highly tentative values for the density of matter in space, calculated a few years ago by astronomers of the Carnegie Institution of Washington, are, for each cubic meter, six sodium atoms, two-tenths of a potassium atom, one-tenth of a calcium atom, and a thousandth of an atom of the relatively rare element titanium, in addition to very much larger numbers of hydrogen atoms and of free electrons. Now there must be added a minute bit of iron and various very simple carbon molecules.

Not Equally Distributed

This matter is not distributed equally through space. It is gathered in cosmic clouds, often of enormous size and of inconceivably low density. In some parts of the heavens these clouds are so extensive and numerous that they affect profoundly the light from far-away stars passing through them, shut off from view distant parts of the galaxy, and tend to give astronomers a distorted picture of the system. For one thing, they make it seem larger than it actually is. Their distribution, size and composition constitute a major problem of present-day astronomy.

Just as a dust cloud on the surface of the earth dims and reddens sunlight which passes through it, so these cosmic clouds reduce and redden the light which comes from stars lying beyond them. This reddening is due to the fact that blue and violet light is scattered and absorbed to a much greater extent by dust and gas than is red light. However, by utilizing the superior penetrating power of red light with red-sensitive photographic plates, it has been found possible to extend observations far more deeply than ever before into the complex structure of star clouds and masses of gas concentrated in various regions of space.

One such cloud reddens appreciably the brighter stars in the vicinity of the North Pole. It has a thickness of about 1,000 light years and its nearer edge is some 200 light years distant from the earth. Cosmic clouds are especially abundant in the neighborhood of the Milky Way and prevent astronomers from observing the center of the galaxy, which lies in the direction of the constellation of Sagittarius in the southern sky.

Redness Shows Size

By means of the reddening of light astronomers can estimate the size and density of such clouds. This tells nothing of the nature of the matter composing them. Such information must be obtained in another way—extremely difficult but recently highly productive. Astronomers can actually count the atoms in space, or at least make fair estimates of the number of primary particles of various elements and their physical states.

One of the major accomplishments of modern physics has been the development of spectroscopy.

Each of the 92 chemical elements, when rendered luminous, has a unique spectrum. As an illustration, if the metal calcium is vaporized in an electric arc the resulting gas gives out a definite pattern of bright spectral lines characteristic of calcium and calcium alone. Radiation of quite different wave lengths is given out by luminous iron. Throughout the entire table of the elements not a single pattern is duplicated. When a physicist detects a certain light pattern anywhere in creation, he knows that its source is one specific element only—that where he finds a pattern of the copper spectrum there must be copper, whether it be in a drop of blood or in a star.

Most of the elements have extremely complex spectra consisting of thousands of wave lengths extending from the invisible infrared through visible light far into the invisible ultraviolet. Different lines appear according to the state of the atom—whether it has all its outer electrons or whether one or more of these have been stripped away. Still other lines appear when the element is in molcular combination with some other element.

Physicists have found and classified nearly all the spectral lines of all the elements in their neutral states, in their singly and doubly ionized states, and in their simpler combinations. The labor involved has been almost unimaginably vast. It makes possible analysis of the content—that is, the gas content—of the cosmic clouds.

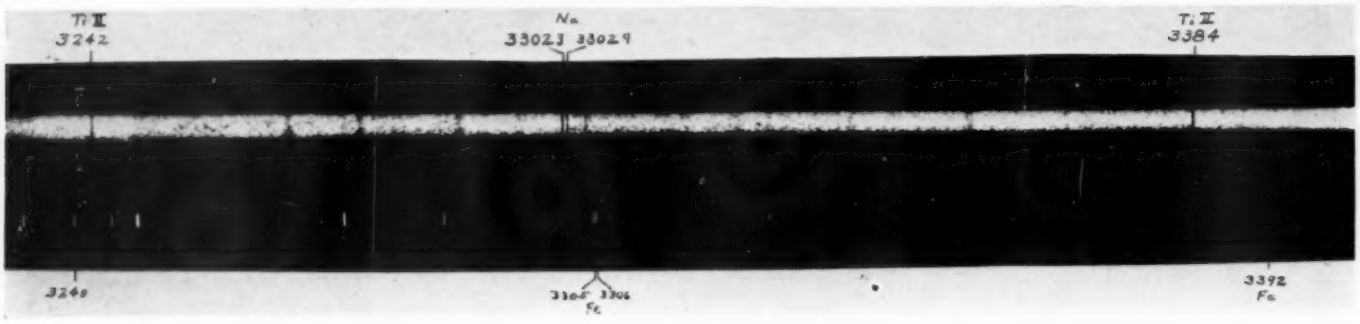
It has long been known that some of the light which passes through a gas is absorbed by the atoms and molecules of the elements which compose the gas. An atom will absorb, however, only wave lengths which, if luminous, it would itself emit. An atom of copper can capture only "copper light," and an atom of phosphorus only "phosphorus light."

The result is a narrow black line on a spectrum photograph. When such lines appear in the spectrum of the light of a star it can only mean that this light has passed through a cloud of atoms of the element which could itself give out the corresponding wave lengths. If a cloud of calcium atoms is present in space, under suitable conditions some of these atoms can absorb the same lines which they can emit in the laboratory.

Spectral Lines Are Faint

Most of the spectral lines of most elements are extremely faint. It must be considered that under the extraordinary conditions of temperature and density which exist in interstellar space, only the very few lines which arise from normally undisturbed atoms can appear, and these will be very dim. The intensity of the lines depends on the number of atoms in a state suitable to absorb light of just the proper frequency of vibration. These, in a gas of extremely low density, are certain to be few.

About 40 years ago came the first clue to the composition of space gas. A German astronomer discovered two faint, narrow lines in the spectrum of a star



SPECTROGRAPH FROM SPACE

It is this sort of record that has revealed to scientists the make-up of the great clouds in heavenly space. On the broad white line, the dark bands near each end indicate the presence of ionized titanium. The close pair in the center are due to neutral sodium.

in the constellation of Orion which were completely different in character from the stellar lines and showed motion —which also can be determined from the nature of the spectrum—quite distinct from that of the star.

They soon were recognized as due to atoms of ionized calcium, that is, atoms minus one electron. Several years later the existence of normal sodium was established from the presence of two well-known lines in the orange region of the spectrum. It so happens that both these lines are easily produced and are exceedingly prominent in laboratory sources and in the spectrum of the sun.

Needed Powerful Equipment

The next step awaited the development of more powerful instrumental equipment. Then, about four years ago, astronomers of the Mount Wilson Observatory identified four lines as due to ionized atoms of the rare element titanium and one each of neutral calcium and neutral potassium.

At the same time they found various other faint lines which were hard to match. Nine of them were in the blue and violet portion of the spectrum. The lines were sharp and narrow in appearance. Seven others, mostly in the red region, were diffuse and broad. The origin of these latter is still unsolved. The blue and violet lines did not correspond to any known to come from any of the elements. The suggestion that they might be due to molecules came from several independent sources. A detailed investigation was made at the Dominion Astrophysical Observatory in Canada. It was concentrated on the relatively few lines, out of the thousands in the bands of the more common compounds in the laboratory, which might be expected to occur under the conditions of interstellar space. Among these were a few lines of the simplest carbon combinations — carbon - nitrogen and carbon-hydrogen. Such a molecule consists of one atom of each element.

Six of the blue and violet lines in interstellar clouds matched lines of these compounds. Three others, two fairly prominent in the clouds, remained unidentified. Within the past few months investigations at the University of Saskatchewan have shown that these also belong to carbon-hydrogen in an ionized condition, or with one electron missing from one of its atoms.

The latest discovery of the Mount Wilson astronomers is that of iron in interstellar space. This is an abundant element throughout the universe. The light given out by iron atoms, however, is distributed among the great number of spectral lines and none is of such predominant intensity as that of some of the lines of calcium and sodium. Any interstellar iron lines could be expected to be extremely faint.

The search was concentrated on two ultraviolet lines in the iron spectrum which arise from the undisturbed state of the atom. After repeated attempts these have been successfully photographed.

At Interesting Stage

The study of these cosmic clouds now is at a most interesting stage. Astronomers know, in part, what they are made of, although doubtless other elements and other simple molecules will be found. They know something of their size, density and distribution. Their composition is far from uniform. Different elements appear to predominate in the gaseous composition of different clouds. This is a field which calls for detailed investigation.

The clouds are not stationary. They are moving with all the complex movements of the galaxy and they have independent drifts of their own. The direction and rate of their movements also can be deduced from study of their spectra. There is a shift towards the red end of the spectrum when an object is moving away from an observer, and the extent of this shift depends upon the speed. Conversely, there is a shift towards the blue when an object is approaching. The motions of the clouds with respect to one another now are being studied. From these investigations may come new light on complex dynamics of the titanic star system.

Interstellar space provides a laboratory for the study of matter under conditions which can be found nowhere else. What is the state of matter under such conditions? Study of the clouds between the stars holds out a hope for some of the answers.

With techniques known at present there would appear to be no hope of penetrating beyond some of the densest of these clouds. They are like great black curtains drawn down in the face of man's curiosity regarding some of the remotest and most significant regions of the vast system of which he forms a part, such as the center of the galaxy. The more he can learn about the nature of these curtains, the greater the prospect will be of seeing something of the mysteries which they hide.

Science News Letter, November 1, 1941

RESOURCES

Midwest Now Grows Coriander Seed

CORIANDER seed that add pungent flavor to candy, beverages, soup and other products are now coming from midwestern farms, instead of such far-off lands as Morocco, France, and the Balkans.

Present midwestern planting consists of 150 acres, with production of about 40,000 pounds of seed. Coriander was formerly summed up by the Department of Agriculture: "No commercial production in the United States."

Science News Letter, November 1, 1941

PUBLIC HEALTH

Territory of Hawaii Is Plague Control Frontier

Constant Vigilance of Health Officials and Dogged Fight Against Rats Keeps America Safe from Disease

By M. F. HARALSON, M.D.

Territorial Commissioner of Public Health

ONE of the great scourges of mankind, bubonic plague, made its reappearance in the modern world when a pandemic of the disease was touched off in Hongkong in 1894.

Swiftly the disease spread to many corners of the globe. In December, 1899, it broke out in the Chinese section of Honolulu. In March, 1900, San Francisco reported the first case on continental America. It spread to Oakland, Seattle, Los Angeles and farther inland.

Today plague is still endemic in the United States. It smoulders among rats of the Territory of Hawaii, and among rats, ground squirrels, marmots and prairie dogs of the far western states. Its occurrence among humans in the United States is rare only because of the unflagging vigilance of health authorities in exercising plague control.

Perhaps the most crucial frontier in this effort to conquer plague in the United States exists here in Hawaii. And in no American area did the "black death" flare up so menacingly as it did in the islands at the turn of this century. Within four months of the discovery of the first case in 1899 there were 71 island plague victims. Since 1899 there have been 401 cases of human plague reported to the Board of Health in Hawaii and 363 of these victims died.

But Hawaii health authorities and the United States Public Health Service have worked valiantly and successfully to combat plague here and protect the people of America from this disease, which still has its primary origin in the Orient. The last case of human plague recorded in Hawaii was in December, 1939. Yet a never-ceasing fight is being waged to control the menace that still exists in the plague-infested rat populations of the islands.

That fight is a dogged one, for there is no minimizing the menace of infected rats. The disease is caused by organisms which are conveyed to man by fleas, for which infected rodents serve as hosts. In the fiscal year ending June 30, 1941, a total of 82 infected rats was found in Hawaii, 80 in the sugar lands of the island of Hawaii and two on the island of Maui. The island of Oahu, where Honolulu is and where United States armed forces are based, has had no plague since 1910.

The Territorial Board of Health's campaign of plague control is prosecuted by a force of 80 workers, concentrated largely in the areas of known infestation on the islands of Hawaii and Maui. Supplemented by allotments from a voluntary shipping tax on Oahu, Maui and Hawaii and by funds from the United States Public Health Service, the Board's plague control budget totals annually about $150,000. Considerable additional funds are spent by sugar and pineapple plantations in the island war on rats.

The principal field control measure is poisoning with banana-phosphorus bait or thallium sulphate treated barley. Last year 2,500,000 pieces of poison bait were placed, most of it outdoors, for Hawaii's rat population is principally a sylvatic one.

Hundreds of snap traps are set, the rats caught in this manner serving as an index to the total rat population. Rat squads also reduce rodent population by gassing field burrows and shooting rats in tree nests.

The Board of Health operates four plague laboratories in the islands, two on Hawaii, one on Maui and one on Oahu. Here more than 100,000 of the 200,000 rats killed or found dead last year were examined for plague. Hundreds of guinea pigs are inoculated yearly with material from rats and with ground-up fleas, to determine infection.

Much of the work done within urban communities of the Territory is the education of householders in methods of eradication—rat proofing, poisoning and trapping.

The program in Hawaii at present provides an index of the rodent plague problem. Island health forces stand constant, vigilant guard against the threat of human plague. And as an island outpost between the Orient and continental America, Hawaii's health department will continue to give its utmost effort to protect the people of the islands and of the United States mainland from the scourge of plague.

Science News Letter, November 1, 1941

MEDICINE

Sulfa Drugs and Serum Cut Pneumonia Death Rate

NINE out of 10 persons who once would have died of pneumonia now are saved, thanks to the sulfa drugs and the development of serum for the 32 different types of pneumonia, Dr. Edmund F. Foley, of the University of Illinois College of Medicine, declared.

Slashing the penumonia death rate from 50% to 5% is "the outstanding medical achievement of the last decade," he said, but warned that even with serums and the sulfa drugs, early treatment for pneumonia is imperative.

Pneumonia, in three-fourths of the cases, begins with the patient "half-sick" with what is thought to be a cold. Several days may pass, days which are valuable for treatment, before the disease is recognized and medical aid sought. In only one-fourth of the cases does pneumonia start explosively with chill, fever, pain, cough and prostration.

Science News Letter, November 1, 1941

South American
BOOM!
Bigger Earnings
More Travel Pleasure
Interesting New Jobs . . IF you
Speak SPANISH
Just Listen to This Record . . .

"Learn by Listening"—to famous Cortinaphone records! Easy; quick; inexpensive—fascinating fun. The NATURAL way to learn. Let Cortinaphone help you profit by U. S. interest in South America.

Sent on 5 Days' Approval

Most fascinating, most satisfactory method known for learning or perfecting yourself in a foreign language. Investigate! **Booklet FREE**

"The Cortinaphone Short-Cut"—tells just what you want to know. Interesting. Get it!

Write Today—NOW

CORTINA Academy (Language Specialists for 50 Yrs.)
Suite 6011, 105 West 40th St., New York City.

Please send me—without obligation—your free booklet. I am interested in (mark):

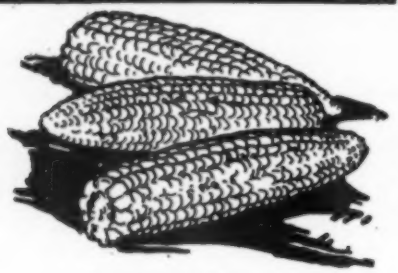
☐ Spanish ☐ French ☐ Italian ☐ German

Name.....

Address.....

NATURE

NATURE RAMBLINGS by Frank Thone



Improper Names

HOW unimaginative human beings are in naming things!

When we go into a new land, or new products of foreign lands are brought to us, we are exceedingly prone to the lazy habit of giving them names of more or less similar things with which we are familiar, with perhaps a qualifying adjective. Very seldom does a new acquaintance from abroad run this gantlet of misnaming and come out with anything resembling its own original name.

We have tropical fruits called custard-apples which are not the remotest kind of kin to apples. The alligator pear is somewhat pear-shaped, but there the similarity ceases. Jerusalem cherries are not cherries, except in size, and they don't come from Jerusalem. Grapefruit resembles grapes only in that the big yellow globes are often borne in close-clustered bunches.

Potatoes were originally called earth-apples, just as tomatoes were called love-apples until only a few decades ago. That misnaming of the potato has become permanent in French, as *pomme de terre*. In German, too, the tuber is called *Erdapfel* almost as often as it is called *Kartoffel*—which latter name, incidentally, seems to have originated as a corruption of the French truffle.

Common corn, which in the Carib Indian language heard by Columbus was known as *mahiz*, somehow was first called Turkish corn on the Continent and Turkey wheat in England. Only later did its proper title, modified to "maize," overtake it in Europe. And in this country only professors wanting to be very exact in their language call it by the name to which it has a right.

Sometimes it is not shape or color that brings on misnaming, but taste or odor. Thus, almost any seeds or fruits that are hot and pungent to the tongue will come to be called pepper, regardless of degree or lack of kinship to the true pepper of the East Indies.

Science News Letter, November 1, 1941

PUBLIC HEATH—RADIO

Loud Noises Injure Health Of Both Old and Young

Anti-Noise Compaigns Should Not Be Confined To Battling Night Rackets That Disturb Sleep

MOTHERS may not agree, but children do not thrive on noise any more than do adults.

Scientific experiments have demonstrated that loud noises affect the health and lessen the efficiency of children at school as well as of workers in the office and factory, Dr. Shirley W. Wynne, former Commissioner of Health of New York City, stated in discussing the subject of "City Noise" at the noise abatement session of the Acoustical Society of America, in New York.

Noise is not merely a nuisance; it is a health hazard, declared Dr. Wynne, who lamented that city health departments confined themselves mostly to suppressing loud noises at night, solely because they disturb sleep. They do more than this. Loud noises at any time are injurious to health. As soon as the public realizes this, Dr. Wynne predicted, the engineers will find a way to reduce noise.

Measurements of the magnitude of noise in various parts of Chicago and its suburbs, made by the Noise Reduction Council of Greater Chicago, were described by H. A. Leedy of the Armour Research Foundation. The average noise level over a period of ten minutes and the maximum and minimum noise levels were recorded by a noise meter. Wherever possible, the source of the louder sounds was determined. These measurements aroused considerable public interest in noise abatement and promise to lead to plans for noise reduction.

Two groups, the National Noise Abatement Council, with support of manufacturers that make noise-deadening and insulating materials, and the Noise Committee of the Acoustical Society, are working to coordinate the sporadic and scattered efforts at noise abatement throughout the country into a national movement. They are seeking to enlist public interest and to find practical ways to reduce the noise nuisance.

Science News Letter, November 1, 1941

High Fidelity Not Wanted

THE PUBLIC does not care for high fidelity radio reception; they prefer low and mellow tones, Ernest La Prade of the National Broadcasting Company told the Acoustical Society.

A survey made in 1940 by Samuel E. Gill showed that owners of radio receivers equipped with tone control devices seldom used them to obtain the whole range of frequency available. Except for trained music lovers, most people preferred to tune out the high pitched notes, Mr. La Prade said.

However, faithful reproduction of music is not merely a question of pitch. It involves such factors as dynamic range, studio acoustics, balance and perspective. And Mr. La Prade concluded that higher fidelity in these respects would be more acceptable to the public than increased frequency range.

Science News Letter, November 1, 1941

SCIENCE NEWS LETTER SUBSCRIPTION COUPON

To Science News Letter, 1719 N St., N. W., Washington, D. C.

☐ Start ☐ Renew my subscription to SCIENCE NEWS LETTER for ☐ 1 year, $5 ☐ 2 years, $7

Name_____

Street Address_____

City and State_____

(No extra postage to anywhere in the world)

INVENTION

Apparatus Speeds Production Of Radioactive Substances

Baffle Plates Which Set Gases Whirling Will Speed Process of Separation of Isotopes; Useful to Industry

MORE speedy production of radioactive potassium and rubidium to be used as substitutes for radium and X-rays in the treatment of cancer, and of other much needed radioactive substances, is provided for by an apparatus invented by Aubrey Keith Brewer of Washington, D. C., and Arthur Bramley of Ocean City, N. J., for which U. S. Patent, 2,258,594 was awarded. This is one of 853 patents granted recently.

The inventors have assigned their patent to the U. S. Government without any payment of royalty to themselves.

The invention consists of an apparatus for the more rapid separation of gases of the same chemical nature but of different molecular weights, or of isotopes—which are different forms of the same chemical element but with different atomic weights. The apparatus is useful both in industry and in research.

Although applying a principle already used in laboratory practice, the inventors have so re-formed the apparatus as to speed up the process.

The principle applied is that if a gas composed of a mixture of molecules of different weights, is admitted to a chamber, one wall of which is kept hot while the opposite wall is kept cold, the lighter molecules will migrate to the hot wall and rise while the heavier ones will migrate to the cold wall and descend. The lighter gas can then be drawn off at the top, the heavier gas at the bottom.

The improvement introduced by the inventors consists principally in certain baffles properly spaced in a long tube whereby whirling motions are induced in the gas which speed up the separation.

Science News Letter, November 1, 1941

Chlorine From Waste Gases

RECOVERY of chlorine—essential for defense, public health, and industry—from waste gases is now possible through a process invented by William C. Klingelhoefer of Syracuse, N. Y., for which he was awarded U. S. Patent 2,258,771.

The waste gases used for this purpose are being obtained in the manufacture of nitrates for explosives and agriculture. These gases contain a considerable amount of nitrosyl chloride. By treating the gases with sulfur monochloride in the presence of a catalyst and putting them through various processes of heating, cracking, cooling, scrubbing and distilling, the chlorine is liberated.

Recovery of chlorine in this way does not use up any other important chemical. Even the sulfur monochloride is recovered for further use.

Science News Letter, November 1, 1941

Parachute With a Dimple

A NOVEL type of parachute which is claimed to open more quickly and more certainly and with less shock to the parachutist is the invention of John Overbeke of Cleveland, Ohio, who has been awarded U. S. Patent 2,258,797.

The parachute is shaped like the top of an apple with a similar central dimple. A cord attached to the apex of the dimple helps to support the parachutist and to keep the dimple in shape. On the inside, the effect is that of a cone with the small end pointed down toward the rushing air. The shape forces the air toward the outer edge, keeping the parachute stretched wide open.

One modification of the shape of the dimple provides a way to prevent spinning of the parachute and jumper during descent.

The central cord, being a little shorter than the outer sustaining shrouds, momentarily deforms the parachute on opening and cushions the shock to the parachutist. By pulling on the cord, he can also regulate the speed of his descent or, after landing, prevent the chute from dragging him along the ground.

Science News Letter, November 1, 1941

Coffee with their meals may be fed to Nicaraguan cows, since tests of coffee berry pulp as feed indicate that it approaches good quality hay in feeding value.

SCIENCE CLUBS OF AMERICA

Sponsored by Science Service

NEWS OF CLUBS

RICHMOND — Industrial organizations and newspapers are cooperating in promoting science club activities, according to James H. Whitehead, sponsor of the Science Club of Maggie Walker High School. Club members find big thrills in successfully reproducing spectacular experiments demonstrated by Mr. Whitehead.

BALTIMORE—Dr. J. Wallace Page, Jr., Director of the Maryland Academy of Sciences, which is starting the second year of an extensive club program, says: "We are interested in cooperating in any movement that carries forward the science club idea and will, of course, put our shoulder to the wheel on the job."

ROCHESTER, N. Y.—The recorded program produced under the guidance of Harry A. Carpenter, Director of the Rochester Science Center, and broadcast internationally over Station WRUL, Boston, on October 13, was so successful that he has been asked to furnish more transcriptions. Emily Reynolds, James Cotanche and John Lamb of the Rochester Inter-High Science Club took part in the broadcast. Other clubs are invited to make recordings for Science Clubs of America's own program broadcast every Monday night, 9:30 EST.

SYRACUSE—Complete cooperation with science clubs has been offered by Dr. Richard R. Armacost, Professor of Science and Education at Syracuse University and Director of the Syracuse Science Center, which is starting its third year with the enthusiastic backing of the university and other organizations.

STATE COLLEGE, Miss.—Clay Lyle, of the Department of Zoology and Entomology of Mississippi State College, announces that the Mississippi Junior Academy of Science is being organized and that it will cooperate fully with Science Clubs of America.

COMMERCE, Texas — Mrs. Emily Barry Walker, Chairman of the Junior Division of the Texas Academy of Science, and sponsor of the East Texas Ornithology Club, reports that the Junior Academy plans to participate in the big national meeting of the American Association for the Advancement of Science, to be held in Dallas in December, and will be grateful for help from other clubs in Texas.

LOS ANGELES—Loyola High School Radio Club, sponsored by Rev. Carl H. Hayn, S.J., has a program of set building, code practice and short lectures on other fundamentals of radio Advanced members are planning to build a public address system and a transmitter.

Clubs are invited to become affiliated with SCA for a nominal $2 for 20 members or less. You can become an associate of SCA for 25 cents, which includes a copy of the 128-page Science Handbook for 1942. Address: Science Clubs of America, 1719 N St., N.W., Washington, D. C.

Languages Made easy By Linguaphone

Speak SPANISH, PORTUGUESE, FRENCH—or any of 29 languages—in an amazingly short time by the simplified, direct Linguaphone conversational method. *In your own home* listen to the voices of native teachers who lead you by easy steps to speak, read and write the language of your choice. Endorsed by the foremost language teachers. Used by a million home-study students. *Send for FREE Book*

LINGUAPHONE INSTITUTE
31 R.C.A. Building New York City

Everyone Can Join in Science Activities

YOU are invited to join thousands of others in a great national movement —Science Clubs of America.

Your participation is needed, whether you are layman or scientist, teacher or student, youth or adult.

In applying science to our world, nation, community, and neighborhood; in making science a part of our daily lives, the energies and enthusiasms of all of us are essential.

• • •

One of the great joys is participation in science activities for fun or as serious amateur endeavor.

One of the great hopes of our civilization is the increasing understanding and practice of science by the millions.

In cellar or attic laboratories and workshops, in museum lecture rooms, after hours in industrial plants, in the great outdoors, beneath the stars, there are groups pursuing their inquiries, eager with accomplishment.

After school, "kept in" by their own thirst for doing, clubs of boys and girls learn what classes and books can not teach, aided by understanding science teachers.

• • •

Great newspapers are making this great movement a part of their public service. School systems are participating and recognizing its worth. Scientific institutions and societies give guidance and encouragement, directing the abilities of their volunteer collaborators to real research. Museums make clubs their own. Industrial concerns lend aid, and profit in good will, public understanding and future developments they can materialize.

• • •

Youngsters and old folks—age is no barrier. Discovery, invention, telling observation—these are no monopoly of any stretch of years.

• • •

To a world at war . . . a civilization threatened . . . to millions insecure and uncertain . . . science is more necessary, group effort more satisfying than ever before.

If you are a *layman interested in science*, whether or not you have a science hobby: Join Science Clubs of America as an associate, organize your own group as a science club, or let us put you in touch with others in your locality. Become a patron and help the movement with your support.

If you are a *science teacher:* See that the club in your school is affiliated. Organize clubs in your school, not just one in general science, but several specialized groups. You will be surprised how this will aid the regular class work. Ask for suggestions on how to organize.

If you are a *professional scientist:* The clubs in your locality will welcome your cooperation, advice and help. Volunteer for this service. Organize an amateur group in your specialty (often amateurs become efficient collaborators). Become an associate or patron.

If you are a *newspaper editor:* Make your newspaper a sponsor of science clubs in your region, cooperating with Science Service. Use Science Service news and features so that club members (and thousands of other readers, too) can keep up to date on the really important developments of the world. Full details will be sent to you or your promotion editor.

If you are a *museum director:* Make your institution a center for science clubs. Science Clubs of America can arrange major cooperation for you from national societies, newspapers, schools, etc.

If you are a *boy or girl:* Join a science club in your school or neighborhood. With the help of a teacher, a parent or a scientist, organize your own science club among your friends. Write for details on how to do this.

What Clubs Receive

A CHARTER—Streamlined, strikingly modern, suitable for framing to display in your club quarters.

MEMBERSHIP CARDS—Identification cards for each member.

SERVICE BULLETINS—Issued from time to time to inform clubs of every service offered by Science Clubs of America. Attached coupons make it easy to order the services most useful to your club.

BOOKLETS—How to Organize Your Science Club; Things Your Science Club Can Do; A Selected List of Books for Science Club Libraries; and others.

INSIGNIA—Handsome 24-kt. gold-plated insignia of Science Clubs of America (25c each). Pendant type may be worn on watch chain or charm bracelet; pin type on coat, sweater or dress.

SCIENCE OBSERVER—8 times per year (free to sponsors) a special Science Observer edition of the SCIENCE NEWS LETTER.

SCHOLARSHIP OPPORTUNITIES—Open only to science club members.

RADIO PROGRAMS—Monthly programs of all national networks.

OPPORTUNITY TO PARTICIPATE IN SALONS OF PHOTOGRAPHY—Local and national showings of prints made by club members.

OPPORTUNITY TO PARTICIPATE IN CINEMA SHOW—A national show of amateur-made movies.

TRAVELING PHOTO SHOWS—Collections of best prints from national salons.

AIDS FOR SCIENCE CLUBS—Lists of material available free or at small cost from commercial sources.

MONOGRAPHS—A series of science club books and monographs, many done by club members, on a variety of subjects useful to science clubs. (10c each).

HANDBOOK OF SCIENCE—An annual compendium of science information (25c each). (Sent free to Associate members).

RESERVATIONS ON THINGS OF SCIENCE—Practical exhibits, experimental material, instructional information in kit form for the club laboratory or museum.

BOOK SERVICE—Arrangements for purchasing any scientific book published in the U. S. Consultation service. Books ordered are sent postage free.

SCIENCE CENTER PROGRAMS announcing meeting places for local and state functions which provide wide opportunities for affiliated clubs.

RADIO BROADCASTS—Regular weekly broadcasts over short wave station WRUL, Boston, for and by science clubs.

PLANS FOR RAISING FUNDS—Numerous suggestions for helping the club to support itself.

THREE TYPES OF MEMBERSHIP

1. **Associate of Science Clubs of America—open to individuals of any age—25c per year.**
2. **Patron of Science Clubs of America—open to individuals of any age—$5.00 or more per year. These funds will be used to support the movement.**
3. **Club affiliation in Science Clubs of America—open to groups of any age—$2.00 for a club of 20 or less; 10c for each additional member. Each club must have a sponsor or leader (more than 21 years of age) who will care for all correspondence with headquarters.**

To SCIENCE CLUBS OF AMERICA
1719 N St., N.W., Washington, D. C.

- ☐ Send me information on organizing a science club.
- ☐ Enroll me as an associate of Science Clubs of America. 25 cents is enclosed.
- ☐ Enroll me as a patron of Science Clubs of America. $5 or more is enclosed.

Name _____

Address _____

_____

Science Clubs of America is an educational, not for profit activity of Science Service, the institution for the popularization of science, 1719 N St., N. W., Washington, D. C., the trustees of which are nominated by the National Academy of Sciences, the National Research Council, the American Association for the Advancement of Science, the E. W. Scripps Estate and the Journalistic Profession.